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Guide to the Lichens of the New York Area—Part 5

G. G. NEARING
ESS

Group 7. The Leather Lichens. Papery Lichens most of which have an upper surface looking somewhat like finished leather, while the under surface resembles the unfinished side of leather. Varying from large mats of radiating trunks and branches with broad tips, to small, scattered, saucer-shaped or fan-shaped fragments. Algal cells mostly in chains, but the chains short and imperfect. Fruits light red to brown or blackish. Spores long and narrow, colorless or brownish, divided into 2 or more cells.

Key to the 4 genera

- Fruits saucer-shape, on the upper surface.....*Sticta*
 Fruits saucer-shape, sunk in marked depressions of the upper surface*Solorina*
 Fruits on the under surface of special marginal lobes which fold upward*Nephroma*
 Fruits on the upper surface of special marginal lobes. Under surface with thickened veins*Peltigera*

Sticta. The name means "speckled," referring to pale dots on the under surface, but the genus as used here includes 3 species which lack the speckling, and are sometimes placed in a genus *Lobaria*, a subdivision which seems unnecessary. The under sur-

face is more or less covered with a fine down or nap and has usually a few small, scattered holdfasts. In most of the species, the algal cells are Nostoc, which should be in long chains, but which are here imperfectly developed, and can be distinguished from the more common Protococcus by their much smaller size, dull blue-green color (contrasting with the bright green of Protococcus), and their frequent appearance in chains of 3 or 4 together, sometimes more.

Sticta amplissima. SPREADING LEATHER LICHEN

Also called *Lobaria amplissima*. Found only occasionally on tree-bark, more rarely on rocks, throughout the New York area, but often large and striking, sometimes in mats 30 or 40 cm. across. The rather flat branches and lobes wavy-margined, as much as 1 cm. across, but usually dividing into narrower tips. The upper surface, smooth, or with narrow wrinkles, is usually pinkish gray or pearl-gray when dry, but when wet is deep grass-green. The downy under surface, pale buff at the margin, may become umber-brown toward the center. The algal cells are said to be Protococcus, but look like Nostoc except that they do not occur in chains.

Fruits are frequent and plentiful, light red when young, becoming brown or blackish with age. They are saucer-shape, up to 3 mm. diameter, usually rather regular, with a thin, smooth, pale rim, and are scattered over the central parts; but small, immature ones appear near the tips as hemispherical warts 1 mm. or less in diameter, each showing a depressed red dot in the center. Spores 4-celled, colorless, 30 to 65 by 4 to 8 microns.

Sticta amplissima at first glance resembles the smaller *Parmelia tiliacea*, and though usually tinted pinkish, may be greenish or bluish gray. The distinct red color of the young fruits distinguishes it from all Shield Lichens, and wetting it brings at once the characteristic deep green color, much greener than any large Papery Lichen which could be mistaken for it. *Peltigera aphthosa* which also turns green when wet, has thickened and darkened veins beneath. From the other Leather Lichens, except *S. herbacea* which is exactly like it in nearly everything but size, and *S. scrobiculata*, which bears warty soredia along the margins, *S. amplissima* stands out by its resemblance to a typical *Parmelia*. It is also the only *Sticta* which can be expected to fruit much in the New York area.

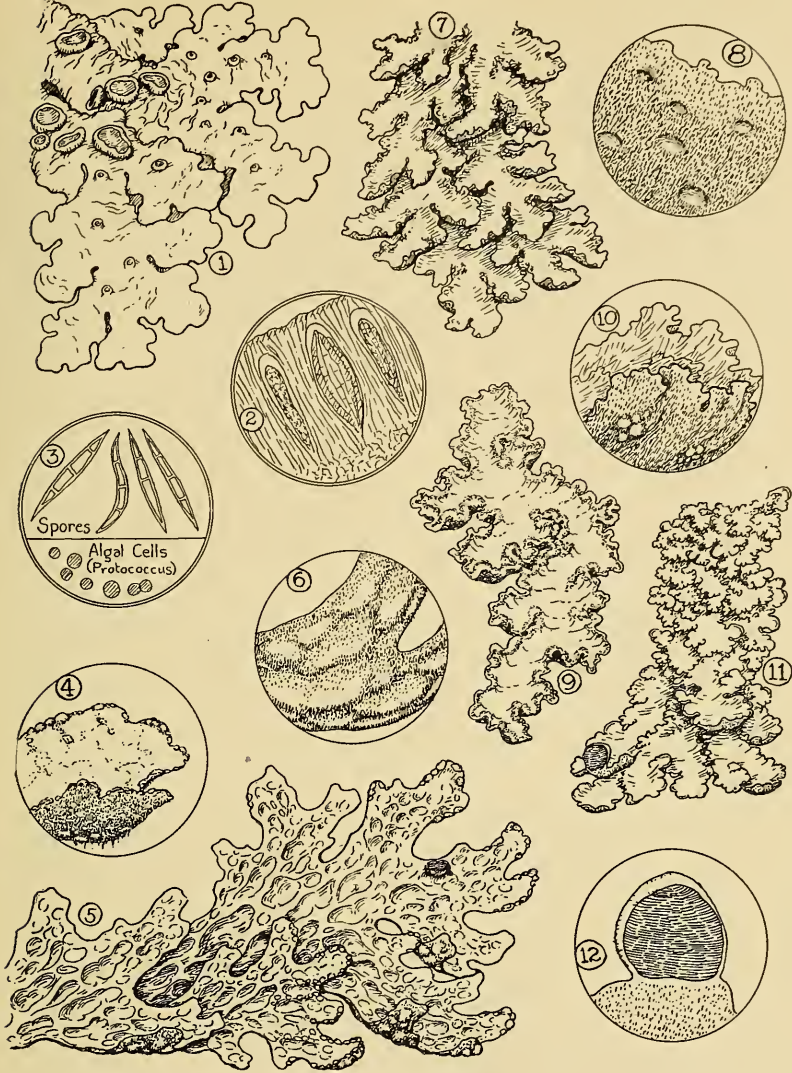


PLATE 9

- Fig. 1. *Sticta amplissima*, gray. Fruits light red.
- Fig. 2. *S. amplissima*, section of spore layer.
- Fig. 3. *S. amplissima*, spores.
- Fig. 4. *S. scrobiculata*, tip, showing soredia above and speckling below.
- Fig. 5. *S. pulmonaria*, gray or brownish.
- Fig. 6. *S. pulmonaria*, downy under surface.
- Fig. 7. *S. quercizans*, leather-brown.
- Fig. 8. *S. quercizans*, downy and speckled under surface.
- Fig. 9. *S. crocata*, brown with yellow margins.
- Fig. 10. *Nephroma resupinatum*, tip showing tubercles beneath.
- Fig. 11. *N. helveticum*, brown
- Fig. 12. *N. helveticum*, under surface of fruiting lobe.

Sticta herbacea. GRASS-GREEN LICHEN

Also called *Lobaria herbacea*. This species, rare in the New York area, differs from *S. amplissima* only in being smaller and thinner, and in having spores divided into only 2 cells and measuring 26 to 44 by 9 to 11 microns. It should be looked for on tree bark. For general characters and comparisons, see *S. amplissima*.

Sticta scrobiculata. WARTY LEATHER LICHEN

Also called *S. verrucosa* or *Lobaria scrobiculata*. Reaching only the extreme northern limits of the New York area, where it may be looked for on tree-bark or over mosses. The lichen forms somewhat irregular rosettes 15 cm. or more across, but with little-divided, wavy-edged lobes as much as 3 cm. across. The smooth or somewhat pitted upper surface is greenish or yellowish gray, often with gray or bluish dusty warts 1 mm. or so in diameter along the margins and ridges. The under surface, pale to dark brown, is clothed with down, but speckled with chalky white, roundish bare patches up to 2 mm. in diameter. Algal cells in chains (Nostoc).

Fruits are unknown in this region.

Sticta scrobiculata differs from *S. amplissima* in its much broader lobes, thicker and more leathery texture, but particularly in the white-speckled under surface. All other speckled Leather Lichens are brown, not gray, and the speckles beneath *S. sylvatica*, *S. quercizans* and *S. fuliginosa* are tiny smooth cups, not mere bare spots. No others have the gray soredia above except *S. pulmonaria* which, instead of speckling below, has a pattern of mounds and grooves, with the summits of the mounds often bare, but buff, not white. *Nephroma resupinatum*, with smaller parts, has white warts on the under surface, but these hardly resemble the flat, white spots of the *Sticta*. Gray forms of *Peltigera polydactyla* and *P. malacea* may appear speckled beneath, but the pale spots are spaces between darkened and thickened veins, and are not bare. Also the enlarged holdfasts of the *Peltigera* contrast with the small, sparse ones of *Sticta*. Yet there are forms of *Peltigera* which when sterile are sometimes mistaken for *S. scrobiculata*.

Sticta pulmonaria. LUNG LICHEN

Also called *Lobaria pulmonaria*. Found occasionally throughout the New York area on tree-bark, over moss at the bases of trees, or on rocks. It forms rather regular, open rosettes up to 25 cm. across, with branches 1 cm. or more wide, ending in angularly tipped lobes usually about 5 mm. wide. The tips are commonly lifted from the foothold as much as 1 cm. Color varies from pale greenish gray to brownish or even blackish when dry, olive-green when moist. The surface is pitted as much as 4 mm. deep, with rounded ribs forming a network between the pits, while the lifted margins and sometimes the ribs may be studded with dusty, gray soredia, with prongs or coral like growths, or with miniature lobes. The under surface is a reverse of the upper, because the substance is thin, and like paper impressed with a seal. The pits of the upper surface become lumps below, the ribs become grooves. The color beneath is buff near the margins, more or less covered with a brownish down, becoming dark brown toward the center. But the humps tend to be bare of down, and show pale buff in contrast to the brownish down of the grooves. The algal cells are not in chains.

Fruits, not common, are disk- or saucer-shape, reddish brown, up to 4 mm. in diameter, close to the margins of the upper surface. Spores 2-celled or 4-celled, 18 to 33 by 6 to 10 microns, colorless when mature.

Sticta pulmonaria is a striking lichen, unique, but suggesting *Cetraria*, just as *S. amplissima* suggests *Parmelia*. It approaches *Cetraria lacunosa* (Group 4), but is easily distinguished by the downy under surface, larger size, and comparatively slight lifting of the tips. *S. pulmonaria* is the most deeply pitted of our lichens. The pitting in *Parmelia saxatilis* (Group 6) is much shallower, and the under surface wholly black. Other pitted species of *Sticta* from which *S. pulmonaria* must be distinguished are *S. scrobiculata*, *S. sylvatica* and *S. anthraspis*, all northern forms, and all with the under surface distinctly speckled. They are besides less narrowly lobed, and sometimes hardly branched at all, suggesting the Rock Tripes (Group 12). It is worth noting that the pitted structure is exactly the reverse of the blistered pattern in *Umbilicaria pustulata* and *U. pennsylvanica* (Group 12).

Sticta anthraspis

A northern lichen perhaps not found in the New York area. The upper surface is pitted much like *S. pulmonaria*, but the branches are as much as 4 cm. across, and but slightly lobed. The under surface is clothed all over with a longer brown nap often 1 mm. deep, and speckled with whitish dots 0.5 mm. or less in diameter, and mounted level with the surface of the nap. The algal cells are Nostoc.

Sticta sylvatica. WOODLAND LEATHER LICHEN

A northern lichen found on trees or rocks as far south as the Catskills, and perhaps also in New Jersey. Usually 3 cm. across or smaller, it may sometimes spread as much as 10 cm. The upper surface is only slightly pitted, leather-brown, olive when moist. There may be minute, gray granules scattered over it. The under surface is covered with a downy nap, buff near the margins to almost black toward the center. It is speckled over with whitish, smooth, cup-like depressions mostly less than 0.5 mm. in diameter. The algal cells are Nostoc.

Fruits rare, usually near the margin, up to 2 mm. across, flat or swollen, reddish brown. Spores with 2 or 4 cells, colorless, 25 to 46 by 7 to 9 microns.

Sticta sylvatica is hardly distinguishable from *S. quercizans* and *S. fuliginosa*, which are separate species in a historical sense, with distinctions about which famous lichenists have disagreed. *S. sylvatica* is of thinner texture, almost like *S. herbacea*. *S. quercizans*, thick and leathery, divides into rather narrow branches and lobes, with crisped margins covered with granules and coral-like growths. *S. fuliginosa* has the granules black or blackish, passing into an incrustation, is thick in texture, like *S. quercizans*, but broad-lobed like *S. sylvatica*. These are minor variations, and the group would be easier to comprehend if they were ignored. But the names date back more than a century, making it difficult now to select one and include the others under it. Taken together, the three species are easily distinguished from all other lichens by the combination of two characters—leather brown upper surface, and downy, speckled, veinless under.

Sticta quercizans. OAK LEATHER LICHEN

A southern lichen found rarely throughout the New York area on trees. It may spread as large as 15 cm., with lobes up to 1 cm. across, overlapping shingle-fashion. The margins are raised and crinkled, bordered with gray granules and coral-like growths. The upper surface is smooth, leather-brown, often becoming reddish when long dry, the under surface covered with a downy nap, and speckled with cup-shaped dots 0.5 mm. or less in diameter. Algal cells Nostoc.

Fruits, rare in this region, resemble *S. sylvatica*.

For comparisons, see *S. sylvatica*.

Sticta fuliginosa. SOOTY LEATHER LICHEN

To be looked for on trees and rocks rarely throughout the New York area, but less rare in New England. A small lichen, usually less than 4 cm. across, but little divided, and with shallowly separated lobes as much as 2 cm. across. The upper surface is smoky brown, dotted or incrustated with blackish granules, the under pale brown with a downy nap, speckled with whitish, cup-shaped dots 0.5 mm. or less in diameter. The algal cells are Nostoc.

Fruits rare, resembling *S. sylvatica*.

For comparisons, see *S. sylvatica*.

Sticta crocata. GOLD-EDGE LICHEN

On trees and rocks anywhere in the New York area, rare, but so conspicuous that many specimens have been collected. Grows in irregular rosettes as much as 15 cm. across, branches usually about 1 cm. wide, the margins lifted and crinkled, dusted with bright yellow soredia, which may also be scattered over the leather-brown upper surface. The under surface is covered with a brown, downy nap speckled with dusty yellow dots sometimes 1 mm. in diameter. Algal cells Nostoc.

Fruits rare in the New York area.

Sticta crocata and the similar *S. aurata* are the only local lichens speckled with yellow beneath. *Cetraria pinastri* and forms of *C. juniperina* have yellow margins, but their under surface is uniformly yellow and not downy. *C. Oakesiana* (Group 5) has green or yellow-green margins, and a habit similar to *Sticta cro-*

cata, but a smooth, brown, unspckled under surface. No other local Papery Lichens, except the all-yellow species of Group 9, have conspicuous yellow margins. In outward aspect, *S. crocata* and *S. aurata* are much alike. *S. aurata*, however, may turn rosy red when dry, and is yellow *within*, as seen where broken, while *S. crocata* is white within. The algal cells in *S. aurata* are probably Protococcus.

Sticta aurata

A subspecies of *C. crocata*, requiring no separate description. See *C. crocata*.

Nephroma. A genus distinct from our other Papery Lichens in having fruits on the *under* surface of special marginal lobes, which curl or fold upward to expose them. Fruits, however, are scarce, and for ordinary identification, the other characters must be noted.

Nephroma resupinatum. BACK-FRUITING LICHEN

Growing on the mossy bases of trees, usually in rather deep woods, not common. It forms irregular rosettes up to 15 cm. or more across, with branches up to 1 cm. wide, though usually smaller. Margins are lifted and waved in irregular fashion, often bearing smaller, fan-like lobes. The upper surface may be gray or brown, sometimes purplish, smooth or slightly wrinkled, more or less covered with a very light down. The under surface is covered with a brown, downy nap, on which are found clusters of white, globular tubercles, each usually less than 0.5 mm. diameter. The algal cells are Nostoc in fairly distinct chains.

Fruits rather rare, up to 1 cm. across, nearly circular, occupying the entire under surface of special lobes or flaps extending from the lifted tips of the branches. Spores brownish, 4-celled or sometimes 6-celled, 19 to 26 by 4 to 7 microns.

Nephroma resupinatum is the original species from which several subspecies have been segregated. It is the only *Nephroma*, and in fact the only local lichen with white tubercles on the under surface. These would not be mistaken for the flat or cupped speckling beneath species of *Sticta*. Otherwise *N. resupinatum* resembles *Sticta amplissima*, differing in its darker color, thinner tex-

ture, and the tendency of the tips to rise 5 mm. or so from the foothold. *N. helveticum*, a more common subspecies, has the margins toothed and splitting into small lobes and coral-like growths. *N. parile* has blue-gray soredia along the margins. *N. laevigatum* is smooth on both surfaces. All three subspecies are distinguished by the absence of whitish tubercles. From species of *Peltigera*, all these are separated by the want of any thickened veins or large root-like holdfasts.

Nephroma helveticum. SWISS LICHEN

Also called *N. resupinatum* forma *helveticum*. A subspecies found on rocks or mossy trees in deep woods throughout the New York area, fairly frequent in western New Jersey. It spreads irregularly in dense mats up to 10 cm. or more across, with branches, when they can be measured, usually about 5 mm. wide, but these divide into many thin, fan-like lobes, rising often 1 cm. from the foothold, the crinkled margins commonly covered with coral-like growths and granules. The upper surface is typically leather-brown, but may be grayish or purplish. The under surface, pale brown and minutely wrinkled near the margins, becomes black and complicated towards the center, where it is clothed with a downy nap.

Fruits scarce, up to 6 mm. across, occupying the under surface of special lobes, reddish brown. Spores brownish, 4-celled, 15 to 22 by 5 to 9 microns.

As *N. helveticum* is usually found sterile, it is not easily identified by one who does not know it, yet has a characteristic appearance. The many coral-like growths and miniature lobes decorating the crinkled margins, make it more complicated than any other non-gelatinous, brown lichen discussed here, except perhaps *Physcia aquila* var. *detonsa* (Group 8) and *Pannaria microphylla* (Group 10), both with much narrower parts. *N. helveticum* is of thinner texture than the other members of Group 7. From all Shield Lichens (Groups 5 and 6) and Blister Lichens (Group 8) it can be distinguished by the dull blue-green color of the algal cells and their tendency to cling in chains. The Jelly Lichens (Group 11) have a gelatinous look when wet, and a much simpler microscopic structure. But *N. helveticum* will be difficult to determine with any certainty until it has been seen in fruit, which

removes all doubt. For distinctions between species of *Nephroma*, see *N. resupinatum*.

Nephroma laevigatum SMOOTH SWISS LICHEN

A subspecies differing from *N. helveticum* in the absence of marginal or other growths from the upper surface, and of most of the down from the under. This lack makes it even more difficult to recognize, yet one already familiar with *N. helveticum* can name it at once. It should be studied in connection with that subspecies. There are also intermediate forms.

Nephroma parile. POWDERY SWISS LICHEN

A subspecies of *N. resupinatum* resembling *N. laevigatum* but with whitish, dusty soredia along the margins and clustered on the upper surface. This is the only local *Nephroma* having soredia. Found on trees in the north, perhaps not within the New York area.

(Group 7 to be continued)

RIDGEWOOD, N. J.

BOOK REVIEWS

Trees of the South*

ARTHUR HARMOUNT GRAVES

The situation with regard to books about trees seems to be similar to that concerning text books of botany. It would seem that every botanist who *is* anybody has written, is writing, or will write a text book of botany. And everyone knows that the books about trees are legion. And yet, as the Book of books says, "Of the making of many books there is no end."¹ I have always taken this as meaning not a countless repetition of the same old thing, but that new, and ever new, outlooks, new treatments of the subject

* *Trees of the South*. Green, Charlotte Hilton. Univ. of North Carolina Press, Chapel Hill, N. C. 551 p. \$2.50.

¹ Ecclesiastes 12.12.